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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,590	03/20/2006	Takashi Takeuchi	043888-0456	3392

53080 7590 05/06/2009

MCDERMOTT WILL & EMERY LLP
600 13TH STREET, NW
WASHINGTON, DC 20005-3096

EXAMINER	
BEST, ZACHARY P	
ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
05/06/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/572,590	TAKEUCHI ET AL.	
	Examiner	Art Unit	
	Zachary Best	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-16* is/are pending in the application.

4a) Of the above claim(s) *16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

NON-AQUEOUS ELECTROLYTE SECONDARY BATTERY

Examiner: Z. Best S.N. 10/572,590 Art Unit: 1795

DETAILED ACTION

1. Applicant's amendment filed February 12, 2009 was received. Claim 1 was amended. Claim 6 was cancelled.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-5 and 7-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one

skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 recites the limitation where $0<z\leq0.05$; however, there is no support for the variable z being greater than zero (and not also equal to zero). If Applicant believes that the rejections are in error, it is requested that Applicant point with specificity to the location of the support for said amendment.

6. Claims 1-5 and 7-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In the instant case, it is not clear from the specification as to what process distributes element L on the surface portion of the particle as recited in independent Claim 1.

Claim Rejections - 35 USC § 102

7. The rejections under 35 U.S.C. 102(b) of Claims 1-4, 7, 13, and 15 as being anticipated by Tanaka et al. (US 2003/0134200) are maintained. The rejection is repeated below for convenience.

As to claims 1 and 7, Tanaka discloses a non-aqueous electrolyte secondary battery [0011] comprising a cathode (positive electrode), an anode (negative electrode) [0014], a separator [0022] between said cathode and anode (Figure 1), and an electrolyte [0037], wherein said positive electrode comprises a positive electrode active material represented by

a general formula: LimMxM'yM"zO2where, M is Co, M' is Zn, Ti, Mg, and M" is Mg or Ca [0012], (LixMel_y_zMyL~O2, where said element Me is at least one transition metal element except Ti, Mn, Y and Zr, said element M is at least one selected from the group consisting of Mr, Ti, Mn and Zn, and said element L is at least one selected from the group consisting of AI, Ca, Ba, Sr, Y and Zr). Tanaka discloses x is designated by an expression of 0.9 x 1, y is indicated by an expression of 0.001 y 0.5, z is indicated by an expression of 0 z 0.5, and m is indicated by an expression of 0.5 m (general formula satisfies LixMel_y_zMyLzO2, where 1 x 1.05, 0.005 y 0.1 (with the proviso that 0.005 y 0.5 is satisfied in the case of said element M being Mn) and 0 z 0.05)) [0012]. Tanaka discloses the separator 13 (Figure 2) is composed of a porous film made of a polyolefine material such as polypropylene or polyethylene, or a porous film made and may have a structure that two or more kinds of these porous films are laminated [0036] (a plurality of laminated monolayer films) and microporous [0035] (microporous structure). Tanaka discloses a cathode 11 faces separator 13 (Figure 2) made of microporous polypropylene film [0170] (Figure 2) positive electrode-side monolayer film selected from said plurality of monolayer films which faces said positive electrode comprises polypropylene).

Tanaka further discloses a method in which a lithium compound is prepared of the same general preparation as the claimed composite oxides of general formula invention (LixMel_y_zMyLzO2). Tanaka discloses a compound containing lithium carbonate (Li.sub.2CO.sub.3), manganese dioxide (MnO.sub.2) and chromium trioxide (Cr.sub.20.sub.3) mixed together. The mixture thus obtained was sintered in air at the

temperature of 850.degree. C. for 5 hours to produce manganese-containing oxide LiMn.sub.1.8Cr.sub.0.20.sub.4 containing lithium, manganese and chromium as a first element (Ma). Further, lithium hydroxide (LiOH), nickel monoxide (NiO) and cobalt monoxide (COO) were mixed together and the mixture thus obtained was sintered in air at the temperature of 750. °C to produce nickel-containing oxide LiNi.sub.0.8Co.sub.0.20.sub.2 containing lithium, nickel and cobalt as a second element (Mb) Then, the manganese-containing oxide and the nickel-containing oxide thus obtained were changed to particles having the average diameter of 5 m. After that, the pulverized and classified manganese-containing oxide and nickel-containing oxide were mixed in the weight ratio 4:6. [0158], [0159] (The composite oxides represented by the general formula: LixMel-y-zMyLzO2 can be synthesized by a method in which a compound containing the element Me, a lithium compound, a compound containing the element M and a compound containing the element L are pulverized and then mixed at a desired composition, followed by baking, or by solution reaction. The baking temperature is preferably a temperature at which the mixed compound is partially decomposed or melted, namely 250 to 1500°C).

However, it is the position of the examiner that the other properties of said material, are inherent, given that Tanaka uses the same approach to making the compound as that claimed (pulverizing, mixing the composition, followed by baking), Tanaka's compound achieves the same compositional gradient as that claimed. Therefore the particle distribution of said compounds would be inherent, namely, wherein said element M is uniformly distributed in said particle, and said element L is distributed more in a surface portion of said

particle than an inside of said particle and wherein when a radius of said particle is r, said element L is distributed in a region within 0.3r from the surface of said particle at a concentration not less than 1.2 times higher than that in a region within 0.3r from the center of said particle. Therefore, the method of production disclosed by Tanaka and the present application are similar. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. In re Robertson, 49 USPQ2d 1949 (1999).

As to claim 2, Tanaka discloses wherein said element M (Me) is at least one kind of element selected from Ni and Co (wherein said element Me is Ni and/or Co) [0012].

As to claims 3 and 4, Tanaka discloses wherein said element M (Me) is at least one kind of element selected from Ni and Co (wherein said element Me includes Ni and Co) [0012] and wherein said element M' (M) is Mn [0013] and said general formula satisfies 0.001 y 0.5 (discloses 0.005 y 0.03) [0012], [0013] and 0 z 0.5 (discloses 0.01 z 0.05).

As to claim 12, Tanaka discloses as the positive active material of the nonaqueous electrolyte secondary battery, lithium cobalt oxide, where a part of cobalt may be considered to be replaced by aluminum, which is an element high in bond energy with oxygen [0044].

As to claims 13 and 15, Tanaka discloses porous films are laminated [0036] (a plurality of laminated monolayer films); and a charging and discharging test carried out for the nonaqueous electrolyte secondary battery [0173]. It is noted that the method steps of claim 13, "wherein...films is formed by drawing a sheet obtained by extrusion..." and claim

15, "wherein said battery is charged by a charge control system whose end- of-charge voltage is set to not less than 4.3 V" are irrelevant, as the claim language states a product by process limitation, wherein the product of the instant application and that of Tanaka is the same. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same or obvious from a product of the prior art, the claim is unpatentable even thought the prior product was made by a different process. In re Thorpe, 227 USPQ 964,966 (Fed. Cir 1985).

Claim Rejections - 35 USC § 103

8. The rejections under 35 U.S.C. 103(a) of Claims 5, 8-12, and 14 as being unpatentable over Tanaka et al. (US 2003/0134200) as applied to Claims 1-4, 7, 13, and 15 above, and further in view of Lee et al. (US 2006/0188786).

As to claim 5, Tanaka discloses wherein said separator (which comprises positive electrode-side monolayer film) [0035], [0036] is composed of polyolefine material such as polypropylene or polyethylene and may have a structure that two or more kinds of these films are laminated (comprises polyethylene and polypropylene) [0035], [0036].
Tanaka does not disclose the amount of said polypropylene is not less than 60 wt% relative to the total amount of said polypropylene and said polyethylene.

Lee discloses a microporous film applied to a separator comprising a blend of polypropylene and polyethylene wherein 60 wt% of polypropylene and 40 wt% polyethylene are manufactured [0078] in order to improve the function of the separator [0027-0030]. Lee therefore recognizes the advantages to modifying the weight percent and ratio of polypropylene and polyethylene. Therefore the weight percent of polypropylene relative to the total amount of said polypropylene and said polyethylene is a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. In re Boesch, 617 F.2d 272,205 USPQ 215 (CCPA 1980). See MPEP 2144.05.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tanaka's separator so that the monolayer comprises 60 wt% of polypropylene and 40 wt% polyethylene because, as Lee teaches, modifying the weight percentages of polypropylene and polyethylene improve the function of the separator [0027-0030].

As to claims 8-11, Tanaka discloses microporous films are laminated [0036] (a plurality of laminated monolayer films), wherein the microporous films have a thickness of 50m (a thickness of not less than 8 micrometers) [0170]. Tanaka does not disclose wherein at least one selected from said plurality of monolayer films has a pore closing temperature of 110 to 140°C, nor the amount of said polypropylene is not greater than 20 wt% relative to the total amount of said polyethylene and said polypropylene.

Lee discloses a precursor film (of polypropylene and polyethylene [0078]) annealed at 120°C (falls within the claimed range of a pore closing temperature of 110 to 140°C") [0079]. It would have been obvious to one of skill in the art at the time of the invention to modify Tanaka's film thickness In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teaching of the applied prior art. Exparte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

In the case of the instant application the basis for the expectation of inherency is that the materials, polypropylene and polyethylene film, used in Lee and Tanaka are the same. Since Tanaka uses the same materials as Lee, polypropylene and polyethylene film, it is inherent that Tanaka's polypropylene and polyethylene film achieves the same annealing temperature of 120°C and therefore teaches a pore closing temperature of 110 to 140°C.

Tanaka discloses the claimed invention except for said polyethylene film not facing the positive electrode. It would have been obvious to one having ordinary skill in the art at the time the invention was made to place said monolayer film whereby said film does not face said positive electrode, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86, USPQ 70.

Tanaka discloses wherein said separator (which comprises positive electrode- side monolayer film) [0035], [0036] is composed of polyolefine material such as polypropylene or polyethylene and may have a structure that two or more kinds of these films are laminated (comprises polyethylene and polypropylene) [0035], [0036].

Tanaka does not disclose the amount of said polypropylene is not greater than 20 wt% relative to the total amount of said polyethylene and said polypropylene.

Lee discloses a microporous film applied to a separator comprising a blend of polypropylene and polyethylene wherein the wt% of polypropylene and wt% polyethylene are manufactured [0078] in order to improve the function of the separator [0027-0030]. Lee therefore recognizes the advantages to modifying the weight percent and ratio of polypropylene and polyethylene. Therefore the weight percent of polypropylene relative to the total amount of said polypropylene and said polyethylene is a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. In re Boesch, 617 F.2d 272,205 USPQ 215 (CCPA 1980). See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tanaka's separator so that the monolayer comprises the amount of said polypropylene is not greater than 20 wt% relative to the total amount of said polyethylene and said polypropylene because, as Lee teaches, modifying the weight percentages of polypropylene and polyethylene improve the function of the separator [0027-0030].

As to claim 12, Tanaka discloses a cathode 11 faces separator 13 (Figure 2) made of microporous polypropylene film [0170] (Figure 2) (positive electrode-side monolayer film), said film inherently has a thickness. Tanaka does not disclose wherein said monolayer film has a thickness of not less than 0.2 micrometers and not greater than 5 micrometers.

Lee discloses the advantages of varying the thickness of said monolayer films (Table 1, film thickness in micrometers). Lee therefore recognizes the advantages to modifying the thickness of said monolayer films. Therefore modifying the thickness of said monolayer films is a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. In re Boesch, 617 F.2d 272,205 USPQ 215 (CCPA 1980). See MPEP 2144.05.

As to claim 14, Tanaka does not disclose wherein said positive electrode-side monolayer film has an average pore size D1 based on a total pore volume measured by a mercury intrusion method, and said monolayer film having a pore closing temperature of 110 to 140°C has an average pore size D2 based on a total pore volume measured by a mercury intrusion method, DI D2 is satisfied.

Lee discloses the advantages of modifying the qualities (pore size) of the microporous film structure (Table 1, [0103]) in order to optimize the characteristics of the microporous film. Lee therefore recognizes the advantages to modifying the pore size of the microporous film structure (Table 1, [0103]) in order to optimize the characteristics of the microporous film. Therefore modifying the qualities (pore size) of the microporous film structure (Table 1, [0103]) in order to optimize the characteristics of the microporous film is a result effective variable. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. In re Boesch, 617 F.2d 272,205 USPQ 215 (CCPA 1980). See MPEP 2144.05.

Response to Arguments

9. Applicant's arguments filed February 12, 2009 have been fully considered but they are not persuasive.

Applicant argues:

(a) That the process of Tanaka would not inherently create the instantly claimed product having element M uniformly distributed in said particle, and element L distributed more in a surface portion of said particle than an inside of said particle.

In response to Applicant's arguments:

(a) Examiner notes the difference between the process as taught by Tanaka et al. having an external addition method and the process as explained by Applicant having a coprecipitation method and the external addition method. However, there is no evidence that element M in the Tanaka et al. process will not be uniformly distributed. Furthermore, the process of Applicant for Step A (coprecipitation) states that an [hydro]oxide is created having element M and Co uniformly distributed (par. 95). This precursor material is then later mixed with other compounds and baked (Step B), but there is no evidence that because of Step A the uniformity remains. Furthermore, the battery A22 in the instant specification merely states that Mg added by external addition according to an undisclosed process was not uniformly dispersed. In the Tanaka et al. process a manganese-containing oxide (oxide containing element M) is separately made from manganese containing precursor materials

(pars. 125 and 158-59), which may be manganese hydroxides. Tanaka et al. further teach that the other precursor materials may similarly be hydroxides, carbonates, organic acid salts, etc. (par. 125) in order to form the material in solid solution (par. 49). It is Examiner's position that the precursor materials would be uniformly mixed to create the composite oxide.

Furthermore, it is assumed that element L forms preferably at the surface of the particle at Step B during the baking treatment because element L is not present in Step A. Tanaka et al. teach the similar precursor materials and baking step, and therefore it is believed that the element L will similarly form at the surface portion.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Best whose telephone number is (571) 270-3963. The examiner can normally be reached on Monday to Thursday, 7:30 - 5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

zpb

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795